On the Processing of Negative Polarity Constructions: Evidence for Strong and Weak Licensing

In this ERP-Study (ERP for Event Related Brain Potentials) I investigated the language processing of the German negative polarity item (NPI) *jemals* (ever) occurring in two different licensing contexts, namely negation (ex.1) and wh-question (ex. 2).

(1) **Kein** Jäger hat den Angler *jemals* gestört.
No hunter has the fisherman   ever disturbed.
No hunter has ever disturbed the fisherman.

(2) **Welcher** Jäger hat den Angler *jemals* gestört?
Which   hunter   has the fisherman ever   disturbed?
Which hunter has ever disturbed the fisherman?

I further investigated the differences in language processing of the German NPI *jemals* occurring in those contexts that fail to license the NPI, namely definite and indefinite determiner (ex. 3 and 4). (According to the time limit of the talk I will not go into detail concerning the determiner contexts.)

(3) ***Der** Jäger hat den Angler *jemals* gestört.
The hunter has the fisherman ever disturbed.
The hunter has ever disturbed the fisherman.

(4) ***Ein** Jäger hat den Angler *jemals* gestört.
A hunter has the fisherman   ever   disturbed.
A hunter has ever disturbed the fisherman.

The study revealed different ERP effects for both contexts (negation and wh-question) showing that the NPI *jemals* is processed in a different way, respectively. Hence, the study showed differences in the processing of strong and weak NPI-licensing.

NPIs are lexical elements that have specific lexical features, namely they need to be licensed. This restricts their occurrences to certain contexts. Such contexts are i.e. negation (negative quantifier or verbal negation), (wh-)questions, conditionals, restrictors of universal quantifiers as well as negative adversatives. Although all these contexts have the common feature that they can license a NPI they "behave" differently.

Finding a sufficient explanation for the licensing problem of NPIs has troubled linguist society for about a quarter of a century. There is still disagreement since theoretical suggestions have been developed stretching from syntax (i.e. Klima, 1964; Haegeman, 1995; Progovac, 1994) throughout semantics (Ladusaw, 1979; Horn, 1985; Zwarts, 1993; van der Wouden, 1997) and pragmatics (Linebarger, 1980, 1987; Krifka, 1995) onto a combination of the three stated linguistic areas (Baker, 1970b). The most appropriate explanation for the licensing problem of a NPI can be stated as follows: To accomplish the licensing of an NPI appropriately two conditions have to be met: First, there has to be a licensor (semantic-pragmatic condition). Second, the licensor has to be structurally accessible which means that the NPI has to be overtly c-commanded by the licensor (syntactic condition). From the psycholinguistic view, NPIs are interesting since they inquire about if there are differences between semantic/pragmatic and syntactic processing. Due to ERP-results we tempt to increase indications for the specific features of NPIs. We want to know how NPI-features relate to specific contexts and which demands are made as to the language processor.

Former ERP studies with the German NPI *jemals* (i.e. Drenhaus et al., 2005; in press) revealed amongst others a N400-P600 pattern when there was a violation of licensing concerning the NPI. Licensing failures where due to the complete absence of a licensing element (ex. 5b) or when the licensing element was structurally not accessible (ex. 5c).

(5)   a) **Kein** Mann, der einen Bart hatte, war *jemals* glücklich.

b) *Ein Mann, der einen Bart hatte, war *jemals* glücklich

c) *Ein Mann, der **keinen** Bart hatte, war *jemals* glücklich.

The current study investigated the processing of the NPI in two different licensing contexts (negation and wh-question (ex. 1 and 2)) as well as two contexts that failed to license the NPI (definite and indefinite determiner (ex. 3 and 4)). Regarding former concerning the NPI *jemals* studies (see above) the prediction was made that the data should show a biphasic N400-P600 pattern on the NPI for both ungrammatical conditions (ex.3-4) compared to the grammatical conditions (ex. 1-2), respectively.

The results showed a biphasic N400-P600 pattern on the NPI in the two ungrammatical conditions in comparison with the negation context. There was also found a modulation of the N400, showing that the violation of licensing is stronger for the definite condition. A difference for the P600 could not be found. For the two ungrammatical conditions in comparison with the wh-licensing context only the definite condition revealed a biphasic N400-P600 pattern. The indefinite condition only showed a P600; a N400 could not be found. The data neither showed a difference for the P600 for both of the ungrammatical conditions. The contrast between both of the grammatical conditions showed a negative run of the wh-curve throughout the entire time-window compared to negation.

The results revealed that there is a higher processing load for the wh-condition, meaning that it is harder to integrate an NPI into a wh-licensing context. The results suggest, that there are differences in strength of the two licensing contexts. (For theoretical discussions concerning NPI-licensing-strength, see i.e. Zwarts, 1993; van der Wouden, 1997 and Krifka, 1995.) Negation is claimed to be the strongest licensing context for a NPI. This is also revealed by the data since the wh-context seems to be weaker which is reflected by the absence of the N400 in the indefinite condition. According to the strength hierarchy of van der Wouden (1997) negation indeed takes a higher position than interrogatives, which means that negation has a higher licensing potential concerning NPIs (see also Zwarts, 1993). However, the data also showed that Ladusaw's (1979) assumption for all NPI licensing contexts are downward entailing is true for the negation context but does not necessarily work for the wh-context regarding the ungrammatical conditions (i.e. seeing the absence of the N400 in the indefinite condition).

To conclude, the results of this ERP-study confirm that there is indeed a psycholinguistic authenticity concerning the processing of negative polarity items. With regard to the theoretical assumptions of NPI licensing contexts concerning their difference in licensing strength the ERP results clearly reflect psycholinguistic evidence for strong and weak NPI-licensing contexts.